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# Department of Environmental Protection

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Colleen M. Castille  
Secretary

August 15, 2006

Murray Miller  
Water Supply Department  
South Florida Water Management District  
P.O. Box 24680  
West Palm Beach, FL 33416-4680

RE: Florida Bay Minimum Flows and Levels

Dear Murray:

The Department appreciates the opportunity to review the March 2006 *Draft Technical Documentation to Support Development of Minimum Flows and Levels for Florida Bay* and the July 2006 draft rule defining the MFL for Florida Bay. The District's analysis focused on the northeastern portion of Florida Bay that is primarily influenced by the fresh water flows from Taylor Slough. The District's technical report presents a comprehensive look at the information available on the factors that influence the various habitats found within the Bay and the transitional zone found between the bay and the Everglades. Through the analysis, the District determined that maintaining a viable presence of submerged aquatic vegetation within the transition zone was the most protective attribute upon which to base the MFL.

There was clearly a large amount of effort put into the report and, in general, the thoroughness and quality of the data analyses are excellent. Overall, the document was comprehensive, well written, and followed a logical methodology for determination of minimum flows needed to prevent significant harm to the Florida Bay ecosystem. The Department offers the following comments as you proceed with the development of this important MFL.

## Salinity Target

The investigators correctly chose *Ruppia maritima* as a keystone species for the Valued Ecological Component (VEC) analysis. The authors demonstrated that *Ruppia* cannot thrive in average monthly salinity conditions that exceed 30 psu. They also established the habitat importance and cascading food web complications that transpire when *Ruppia* is eliminated.

The authors also identified two plant taxa, *Utricularia* and *Najas*, that are important components of the oligohaline transitional community, and much more sensitive to salinity increases (these taxa don't generally occur when salinity averages above 2 psu). These plants are important indicators of potential zones of fresh water, contiguous to the estuary, which are critically needed

by young, endangered American crocodiles. It seems that the proposed MFL did not take into account the effects of a shift in community structure from one that consists of a mix of *Ruppia*, *Utricularia*, and *Najas* to one that might consist only of *Ruppia*. The District should use the spatial distribution and salinity requirements of these plants to model the amount of fresh water inputs needed for their protection (and indirectly, the protection of the crocodile). If this analysis suggests that higher amounts of fresh water inputs are required for the area, it would be considered more protective than the current proposed MFL.

The technical report also noted that *Ruppia* was sensitive to extreme changes in salinity as well as high salinities. The document did not identify the fluctuations that might be harmful to *Ruppia*. If possible, the salinity target should also include a monthly maximum salinity change to prevent potential harmful fluctuations that are not accounted for by using a monthly mean salinity-based MFL.

Additionally, the technical report refers to salinity concentrations in "practical salinity units", but the draft rule uses "parts per thousand." The draft rule should be modified to be consistent with the units in the technical report.

### **Return Frequency**

The proposed rule indicates that an MFL violation occurs when two exceedances "occur within a period of two consecutive years, more often than once in a six-year period." The District determined that six years between exceedances was adequate for the *Ruppia* to recover from these high salinity events by looking at the period of record and determining how often the events occurred in the past. However, using the average over the period of record does not adequately describe the actual frequency at which the community was subjected to periods of high salinity. When looking at Figure 52 of the technical report, the high salinity events are not evenly distributed over the 30 years; they appear to be clustered in groups approximately 14 years apart (1970 -1975 and 1989-1991). It seems that the return frequency that would prevent significant harm to *Ruppia* should be 14 years rather than 6 years.

### **Future Work**

The technical report notes that the analyses presented are based upon best available information. As a result, the District has identified several very good recommendations for future work that would help further refine and improve the proposed MFL. Additionally, we suggest that the District also consider include the following:

- In addition to conducting more research of the effects of salinity on *Ruppia*, additional research is needed to examine the effects of salinity on other SAV habitats, fish, and invertebrates. This could lead to the development of a suite of other indicators that represent the overall biodiversity of the Florida Bay ecosystem.
- The proposed salinity monitoring should be capable of hourly measurement to monitor salinity change on a more biologically relevant time scale. These stations should also have real time data delivery capabilities. This design would provide the potential to

manage upstream canal control structures to allow fresh water delivery to be dynamically linked (via models) to estuarine salinity targets (the District should also consider including this as part of the MFL prevention strategy).

- Conduct an analysis of the effect of low flow on other parameters such as nutrients, dissolved oxygen, and metals. It would also be beneficial to demonstrate any relationships between other water quality parameters, such as dissolved oxygen or metals (Hg, Pb, etc.), and low flow conditions.


The District does not expect violations of the proposed MFL to occur and has determined that a prevention strategy is necessary to ensure this. The rule notes that the LEC Regional Water Supply Plan will contain the approved prevention strategy and we look forward to seeing the details of this strategy.

### **Future MFL Establishment**

The MFL that is currently proposed will prevent significant harm only in the Northeastern portion of Florida Bay. It is our understanding that the Florida Bay/Florida Keys Feasibility Study will lead to the development of additional models of Florida Bay. The additional information gathered from the completion of these studies should be used to establish MFLs for the other regions of Florida Bay. The District should modify their MFL priority list to include the remaining areas of Florida Bay. Additionally, the District should commit to re-evaluating the MFL for the Northeastern portion of Florida Bay after the completion of the study.

Generally, the conclusions of the report seem reasonable and we commend the District on the comprehensive and informative technical report. We appreciate the opportunity to provide you with our comments on this important MFL. If you have any questions or would like to discuss this further, please contact Kathleen Greenwood at 850-245-8681.

Sincerely,

  
for

Janet G. Llewellyn  
Deputy Director  
Division of Water Resource Management

cc: Kevin Neal, DEP  
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